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The two special observation periods of the Hydrological cycle in the Mediterranean experiment (HyMeX) took place during autumn 2012 (SOP1) and winter 2013 (SOP2), to study the key processes of the water cycle. AROME-WMED (Fourrié et al, 2015) is a dedicated version of the mesoscale AROME-France model, developed at CNRM since 2008. AROME-WMED covers the western Mediterranean basin and provided the HyMeX operational centre with real-time analyses and forecasts produced on a daily basis. These products allowed precise decision-making on the field campaign observation deployment.
A first reanalysis of the SOP1 has been carried out just after the experimental campaign with AROME-WMED using an unique software cycle and considering few more observations than the real-time version.
A second reanalysis of the HyMeX SOP1 is presented here. This new reanalysis includes a new orography, dedicated model background errors, that have been especially computed over the SOP1 period and much more observations.
Thanks to the vast improvement in terms of several data set reprocessing (wind profiler, GPS, high resolution radiosoundings, bias correction schemes) and assimilated data (Spanish radars, ground and airborne lidar data), a positive impact is found.
The presentation details the different components of the reanalysis. The improvements in terms of analysis and forecast quality with respect to the real-time version and the first reanalysis is illustrated with scores and case studies. The impact of some observation data sets on the forecast quality is evaluated through denial experiments, in which each data set has been removed from the assimilation.
Numerical experiments, excluding specific datasets, were run to evaluate the impact, such as:
i) no reprocessed GPS data,
ii) no high resolution radiosoundings,
iii) no Spanish radar data
iv) no lidar data
v) no wind profilers
Each forecast experiment is compared with the second reanalysis of SOP1 to quantify the impact of the various observation types on the analysis and forecast of high precipitating events.